Simplify code portability and maximize return on investment

WHITE PAPER
VERSION 2.0
The technology of making integrated circuits is advancing very fast. Day by day, new integrated devices and technologies are developed and produced, exponentially more complex than previous series. Accordingly, the application code becomes so complex that it is nearly impossible to add new features, track changes and generally – have a control over the code itself. Once written, the application code can work only on a specific system and with the specific MCU it was written for. Adding a new feature requires complete redevelopment of the code and as a result – increases the time needed and the cost of the whole manufacturing process.

There is an increased demand for the software tools that can cope with the rapid hardware development. The need to unleash the full potential of the embedded hardware is bigger than ever before. The frontier of what is technologically possible is always pushed forward and the software development tools need not restrain or look for compromises – they have to offer solutions and possibilities, instead.
mikroSDK
TOOLS FOR THE PORTABLE CODE DEVELOPMENT

The software engineers at MikroElektronika came up with the solution for this problem in a form of the mikroSDK standard which prescribes a set of coding rules, and the mikroSDK – the software development kit as a set of libraries and standardized function calls used to write the portable application code itself.

Making the application code mikroSDK standard compliant will allow for the application code portability among different platforms, as well as the code reusability.

The mikroSDK uses a modular approach to the portability problem – all the code that is architecture dependent is placed in separate layers. All the code that is specific to the controlled device is also placed in separate layers. Finally, all the hardware specific configurations and functions are located in their separate layers.

This allows the hardware platform to be switched, along with the corresponding layers – the application code will continue to run unmodified since it will get interfaced with the new hardware layer after a single recompiling for the selected architecture.

The story goes the other way around, too. Once written for the specific hardware

Modularity, to cope with the complexity
platform, the same hardware abstraction layer and the board definition files

platform, the same hardware abstraction layer and the board definition files
can be used with any application code, written for a specific device, or a click
can be used with any application code, written for a specific device, or a click
board. For example, whenever a new click board is used, the existing hardware
board. For example, whenever a new click board is used, the existing hardware
layer will get interfaced with the driver layer of the new click board, and after a
layer will get interfaced with the driver layer of the new click board, and after a
single compiling for the selected architecture, the click board will be ready to
single compiling for the selected architecture, the click board will be ready to
be used with no new code written at all.
be used with no new code written at all.

MikroElektronika provides board definition files and hardware abstraction
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layer functions for own branded development systems, along with the example
layer functions for own branded development systems, along with the example
application code in the help file specified for each module – we have it all
application code in the help file specified for each module – we have it all
covered for the end users and developers.
covered for the end users and developers.

Since mikroSDK is provided in a form of open source, it can be modified,
Since mikroSDK is provided in a form of open source, it can be modified,
tweaked and expanded upon with new functionalities. As such, being entirely
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written in pure C language, mikroSDK offers compatibility with virtually any
written in pure C language, mikroSDK offers compatibility with virtually any
standard C compiler.
standard C compiler.

This tree diagram represents the platforms currently supported by mikroSDK.
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The tree will be expanded as new platforms are added.
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PERFORMANCE IMPROVEMENTS AND FUTURE UPGRADES

The applications which are written to be mikroSDK standard compliant will have a small memory footprint compared to the number of supported peripherals. The compiler allows for code optimization by removing unused code sections from the compiling task. This results in smaller final code, further optimized by the smart SAA algorithms used inside the MikroElektronika compilers. The advantages of smaller code are obvious – there is room for even more features in the application code itself.

The mikroSDK is designed with care. It allows for rapid development, it is easy to understand and use, and it is very well documented. The standard strictly defines folder structures, documentation, and the application code format, preventing any ambiguous situations. The mikroSDK is easily expanded and leaves room for future improvements – the backward compatibility is always maintained because the mikroSDK is highly modular.

CONCLUSION

The mikroSDK allows for the rapid software development. The developers do not need to worry about the low-level part of the code, they are able to focus on the application code itself. This means that changing the MCU or even the whole platform will not force developers to redevelop their code for the new MCU or the platform. They will be able...
to just switch to the desired platform, apply the correct board definition file - and the application code will continue to run after a single compiling. The saved time can now finally be invested in the next big project, allowing for faster product delivery and faster return on the investment. Be it PIC, PIC32 or STM - for the user application code - it’s all the same.
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